



Internal Operating Procedure

ISO 9001:2015 SOC NEVADA LLC

DOCUMENT NO.
BOP.IOP.EMB.1302

REV. 9

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TITLE:

ELECTRICIAN MAINTENANCE PLAN

SAI GLOBAL
ISO 9001
Quality

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APPROVAL SIGNATURES		
PREPARED/REVIEWED BY 	CHRISTINA HOLLOWAY, DCA BASE OPERATIONS	DATE 3-26-19
APPROVED BY 	STEVE WILSON, LEADER ELECTRIC SHOP	DATE 3/4/19
APPROVED BY 	TYLER VIANI, ASSISTANT MANAGER INFRASTRUCTURE & GROUNDS	DATE 3/4/19
APPROVED BY 	PATRICIA COEN, MANAGER QUALITY ASSURANCE	DATE 3/12/19
APPROVED BY 	DALE MCNALLY, SUPERVISOR EQUIPMENT MAINTENANCE	DATE 3/4/19
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APPROVED BY 	THERESA VINSON, DIRECTOR BUSINESS MANAGEMENT OFFICE	DATE 3/18/19

☐ INITIAL RELEASE ☐ ANNUAL REVIEW, NO REVISION REQUIRED ☒ ANNUAL REVIEW, REVISION REQUIRED (SEE HISTORY BELOW)

REVISION HISTORY			
REV	CHANGE DESCRIPTION	AUTHOR	DATE
9	ANNUAL REVIEW: UPDATED SIGNATORY AUTHORITY TO REFLECT CURRENT REQUIRED SIGNATURES. UPDATED DOCUMENT NUMBERS IN REFERENCE DOCUMENTS SECTION. UPDATED REQUISITION & JSA FORMS.	CHRISTINA HOLLOWAY	03/2019
8	ANNUAL REVIEW: UPDATED SIGNATORY AUTHORITY TO REFLECT CURRENT REQUIRED SIGNATURES. UPDATED DOCUMENT TO ISO9001:2015. UPDATED TRAINING REPORT DZHC 84-E.	CHRISTINA HOLLOWAY	03/2018
7	ANNUAL REVIEW, UPDATED SIGNATORY AUTHORITY TO REFLECT CURRENT REQUIRED SIGNATURES, UPDATED REQUISITION FORM	CHRISTINA HOLLOWAY	05/2017

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REFERENCE DOCUMENTS	
DOCUMENT NUMBER	DOCUMENT TITLE
CGA 6.7-1996	COMPRESSED GAS ASSOCIATION- SAFE HANDLING OF LIQUID CARBON DIOXIDE CONTAINERS THAT HAVE LOST PRESSURE
CHEMETRON/ CARDOX- FIRE SYSTEMS MANUALS	FIRE SYSTEM LOW PRESSURE CO ² OPERATION & MAINTENANCE MANUALS
FES.IOP.FST.0015	TESTING, INSPECTION, AND MAINTENANCE OF CO ² FIRE SUPPRESSION SYSTEM 110 HG STORAGE
ISS.IOP.EMB.1300	REFRIGERATION AND MAINTENANCE PLAN FOR MERCURY STORAGE
NFPA 12	STANDARD ON CARBON DIOXIDE EXTINGUISHING SYSTEMS
NFPA 72	NATIONAL FIRE ALARM CODE
QP.BOP.MUO.0001	LOCKOUT- TAGOUT PROCEDURES
QP.GMO.SAF.0003	SOC NEVADA LLC- SAFETY PROGRAM
S/N 30000038 REVISION C	CHEMETRON LOW PRESSURE CARBON DIOXIDE OPERATION & MAINTENANCE MANUAL FOR 4, 6, 8, 10 TON STORAGE UNITS.
SOC.QM.0001	SOC QUALITY MANUAL
SOC.QP.EMP.HG.0002	MERCURY TRAINING PLAN
SOC.MS.MP.0001	CONTROL OF DOCUMENTS
SOC. MS.MP.0002	CONTROL OF QUALITY RECORDS
SOC. MS.MP.0003	INTERNAL QUALITY AUDITS
SOC. MS.MP.0004	CONTROL OF NON-CONFORMING PRODUCTS
SOC. MS.MP.0005	CORRECTIVE ACTION RISK MANAGEMENT

DOCUMENTS REFERENCED IN THIS PROCEDURE ARE APPLICABLE TO THE EXTENT SPECIFIED HEREIN.

1. PURPOSE

- 1.1. The purpose of this procedure to establish mandatory requirements to ensure that all electrical personnel understand and follow the safe and proper protocols when inspecting the electrical systems at the mercury storage sites located in the 110 group.

2. SCOPE

- 2.1 This IOP applies to all personnel responsible for providing electrical repairs and maintenance in the mercury storage warehouses located in the 110 group.

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3. DEFINITIONS AND ACRONYMS

- 3.1 **BOP** – Base Operations
- 3.2 **EEBD** – Emergency Evacuation Breathing Device
- 3.3 **FES**- Fire Emergency Services
- 3.4 **GIDEP**- Government Industry Data Exchange Program
- 3.5 **GOC** – Guard Operation Center
- 3.6 **IAW** – In accordance with
- 3.7 **IOP** - Internal Operating Procedure
- 3.8 **LOCK OUT**- The process of preventing the flow of energy from a power source to a piece of equipment and preventing it from being placed in an operational state.
- 3.9 **TAG OUT**- Placing a tag on the power source that identifies to other employees, personnel, contractors, subcontractors etc. that the power source is not allowed to be in an operational mode. The tag acts as a warning to others and is not a physical restraint.
- 3.10 **ZERO ENERGY STATE**- The process of releasing stored energy in an energized system and may involve the following.
 - Draining all valves, bleeding air from a system, eliminating stored hydraulic pressure or any other method that would release energy from a system.
 - Test the machine/ equipment/ system to ensure all energy is disconnected and/ or has been released.

4. FLOWCHART

- 4.1 There is no flowchart associated with this procedure.

5. RESPONSIBILITIES

- 5.1 **THE ELECTRONICS TECHNICIAN WILL ENSURE THE FOLLOWING:**
 - 5.1.1 All energy sources are locked out/ tagged out unless troubleshooting live circuitry and any electrical preventative maintenance is completed safely and on time as scheduled.
 - 5.1.2 Personnel will have the work order at the site while the required work is being performed to ensure all systems checks, reported deficiencies and/ or defects are addressed in their entirety.

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5. RESPONSIBILITIES (CONTINUED)

- 5.1.3 Their shoes/ boots are thoroughly cleaned prior to entering the storage facility by wiping them on the warehouse cleaning mat to protect the teranap flooring (geomembrane). This will ensure rocks, debris and other foreign materials are not carried in from outside which could damage the protective flooring in the mercury storage warehouses.
- 5.1.4 Prior to performing any maintenance or repairs on the CO² system, the system must be brought to a zero energy state IAW QP.BOP.MUO.0001 titled Lockout-Tagout Procedures and QP.GMO.SAF.0003 titled SOC LLC- Safety Program.
- 5.1.5 Should maintenance or repairs be required to be performed in the interior of the warehouse, personnel will have their EEBD available and attached to themselves. Personnel will ensure all four (4) warehouse doors are open for adequate ventilation and emergency egress.
- 5.1.6 Maintenance personnel will ensure that maintenance materials, spare parts, and equipment are available and appropriate for the task that they will perform.

5.2 FIRE AND EMERGENCY SERVICES PERSONNEL (FIREFIGHTERS) ARE RESPONSIBLE FOR:

- 5.2.1 Providing key control to mercury storage warehouses.
- 5.2.2 Providing emergency services to personnel while they are performing inspection, maintenance and repair activities in and on the mercury storage warehouses.

5.3 THE MANAGER OF QUALITY ASSURANCE IS RESPONSIBLE FOR:

- 5.3.1 Analyzing the "not in kind" part/ component replacement within the GIDEP to ensure vendor and part acceptability prior to submitting the requisition to the purchasing department.
- 5.3.2 Documenting and resolution of the receipt of non-conforming products IAW SOC.MS.MP.0004 titled Control of Non-Conforming Products and SOC.MS.MP.0005 titled Corrective/ Preventative Action.

5.4 THE MANAGER OF ENVIRONMENTAL SERVICES IS RESPONSIBLE FOR:

- 5.4.1 Following up with the Manager of Quality Assurance to ensure timely resolution and preventative action to prevent future recurrence.

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6. PROCEDURE

- 6.1 Electronics technician and/or electricians must contact FES to obtain access to the mercury storage warehouses prior to entering any of the buildings used to store elemental mercury.
 - 6.1.1 Facilities used for the storage of elemental mercury (Hg) in the 110 group are as follows:

110-52	110-66	110-77
110-78	110-87	110-88
110-89	110-92	110-93
110-94	110-95	110-96
110-97	110-98	
 - 6.1.2 FES personnel will give the "all clear" for the building to ensure there is an adequate supply of oxygen and that mercury vapor levels are within the acceptable ranges utilizing the mercury analyzer (Lumex) or other recognized air quality monitor.
 - 6.1.3 Notify GOC prior to entering the 110 area by calling Net Control on radio channel one (1) or three (3) or by calling extension 7555 or 7444.
- 6.2 Execute the requirements of the job plan for electronics technician and any other activities as directed/ instructed.
 - 6.2.1 Troubleshoot the facility (ies) and equipment IAW Operator's Equipment Manual.
 - 6.2.2 Perform lock out/ tag out activities IAW QP.BOP.MUO.0001 titled Lockout-Tagout Procedures.
 - 6.2.3 Check voltage, amps and continuity on any electrical systems problems as required.
 - 6.2.4 Repair the affected equipment. Remember all exchanges in parts and equipment must be completed "in kind" in the mercury storage warehouses.
 - 6.2.5 Remove lock out/ tag out upon completion of work activities.
 - 6.2.6 Notify GOC the work has been completed by calling Net Control on channel one (1) or three (3) or by calling extensions 7555 or 7444.
- 6.3 **PART/ COMPONENT REPLACEMENT & QUALITY ASSURANCE**
 - 6.3.1 Part replacement will occur as needed or required by operation maintenance procedures.
 - 6.3.2 All parts removal and replacement shall be performed IAW vendor/ supplier instructions cited in operating and maintenance manuals that were provided with equipment or best engineering/ business practices. When there is a discrepancy in any instruction, directive or written recommendation, the most restrictive practice will take precedence.

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6. PROCEDURE (CONTINUED)

- 6.3.3. Always check the shop storage locations for replacement part availability. If the part/ component is available, confirm part model number by reviewing the part received/ obtained with the shop supervisor. Once the part has been verified, proceed with repairs/ replacements as necessary.
- 6.3.4. When parts/ components are not available from shop supply, the part/ component will be ordered as follows:
 1. As far as practical repair and replacement parts/ components shall be replaced in kind.
 2. If a replacement in kind part/ component is not available, the proposed replacement part/ component shall be subject to review by the Mechanical Integrity Team as described in QP.EMS.HG.0006 titled Mechanical Integrity Procedure to ensure that it is suitable for the process in which it will be used. The process shall be subject to QP.EMS.HG.0007 titled Management of Change, QP.EMS.HG.0002 titled Process Safety Information, QP.EMS.HG.0008 titled Pre-Startup Safety Review and, if warranted, QP.EMS.HG.0003 titled Process Hazard Analysis.
 3. Check the part model number and compare it with the as-built drawings and the Maximo parts listing.
 4. Prepare a requisition (DZHC 16-E Rev. 6) to order the part/ component; ordering the part/ component and submit to the Supervisor of Maintenance Control and Planning.
 5. During the process of ordering the part/ component, a second check shall be performed against Maximo to ensure accuracy of the part/ component.
 6. The requisition will be submitted to the Manager of Quality Assurance for analysis and comparison to the GIDEP to ensure vendor acceptability prior to submission of requisition to the Purchasing Agent.
 7. When the ordered part/ component is received, verify the correct part model number against the part order form. The shop supervisor will also confirm the correct part model number has been received prior to use and replacement of the defective part/ component.
 8. The shop Supervisor will notify the Manager of Environmental Services and the Manager of Quality Assurance of all nonconformance. The nonconformance resolution process, overseen by the Manager of Quality Assurance, provides for the identification, control, and resolution of problems associated with items, activities, or conditions that do not conform to requirements. The process also serves to provide a means to prevent the inadvertent installation or use of nonconforming part, equipment and/ or materials, and the use of substandard services.

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6. PROCEDURE (CONTINUED)

- 6.3.5. Install the part/ component by ensuring all required lock out / tag out requirements have been completed, or that the system(s) are at a **zero energy state**.
- 6.3.6. Install part / component IAW manufacturer's instructions or best business practices.
- 6.3.7. After installation the shop Supervisor will verify the part/ component has been installed per manufacturer recommendation or specification. Both the maintenance person and the Supervisor shall sign the work order form verifying the correct part / component has been installed per manufacturer recommendation or specification. Both the maintenance person and the Supervisor shall sign the work order form verifying the correct part / component was used and installed correctly. The work order form will be returned to the Supervisor of Maintenance, Planning and Housing for data entry into Maximo.
- 6.3.8. Verify the part/ component has been installed correctly and the lock out/ tag out devices can be removed and the system energized if required.
- 6.3.9. Verify replacement part is functional and operational IAW operational manual or best engineering practices.

6.4. EMERGENCY EVACUATION

- 6.4.1. Emergency Evacuation Breathing Devices (EEBDs)
 - 1. Prior to entering any Mercury storage site you are required to inspect your EEBD. Assure the following:
 - a. Breathing device gauge is in the green zone.
 - b. Mouthpiece cover is in place.
 - c. Visual damage is present to the case or container.
 - d. The EEBD is in good working condition.

If the inspection criteria cannot be met and you are unable to verify a through d, the EEBD must be turned in and you must obtain a new one from FES personnel.
- 6.4.2. When the fire alarm system goes into pre-alarm (visual/audio signal) or a hazardous condition exists, notify occupants by verbal communication to evacuate. Simply grab the EEBD at the regulator and pull the unit from the holster. The velcro strap and mouthpiece cover will automatically release. Inhale the first breath and breathe normally while exiting the warehouse. Do Not Run or Rush.

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6. PROCEDURE (CONTINUED)

6.5. EMERGENCY EVACUATION DOORS

- 6.5.1. All doors to the warehouse will be open when maintenance is being performed.
- 6.5.2. The two center doors of the warehouse are for emergency egress only and will not be used for routine operations or forklift use.

7. METRICS

- 7.1 On time completion of work orders (CM, PM).

8. QUALITY RECORDS

- 8.1 The following Quality Records shall be generated and managed in accordance with SOC.MS.MP.0002
- 8.2 The following records will be maintained for CAPP-mandated inspections/ testing/ maintenance activities for a minimum of five years after the inspection/ test/ maintenance activity:
 - The date of the inspection or test
 - The name of the person who performed the inspection or test
 - The serial number or other identifier of the equipment on which the inspection or test was performed.
 - A description of the inspection or test performed
 - The results of the inspection or test

QUALITY RECORDS			
RECORD REQUIRED	CUSTODIAN	RETENTION	DISPOSITION
Requisition	Maintenance Control & Planning/ Environmental Services	5 years	Destroy
Training Report	BOP DCA	5 Years	Destroy
Investigation of Accident/ Injury	Environmental Services/ Safety & Health Office	5 years	Destroy
Work Order (CM, PM)	Maintenance Control & Planning	Life of contract until further notice	
Job Safety Analysis (JSA)	Area Supervisor	5 years	Destroy



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10. ATTACHMENTS (CONTINUED)

10.4 DZHC 167- E: Work Order (Corrective Maintenance)



SOC WORK ORDER DETAIL

WORK ORDER #:	21279	PRIORITY:	89	WORK TYPE:	CM	START DATE:	Jan 9, 2013 12:00 AM
DESCRIPTION:	MERCURY-CO2 VENTING						
LONG DESCRIPTION:							
REPORT DATE:	Jan 9, 2013 12:00 AM	PHONE:	EMD 7781	WORK STATUS:	CLOSE		
REPORTED BY:	RYAN	ON BEHALF OF:		GL ACCOUNT:	4ES-212AB1-2222-22		
ASSET:	ORU-065	DESCRIPTION:	REFRIGERATION UNIT				
LOCATION:	110-078	DESCRIPTION:	MERCURY STORAGE FACILITY				
LOCATION DETAIL:	FOR FIRE SUPPRESSION SYSTEM FOR MERCURY BLDGS				ASSIGNED TO:		
TAG #:		SUPERVISOR:	EQSUPER		LEAD CRAFT:	AC	
SERIAL #:	ET08A00352R	WARRANTY EXP:			CREW ID:	MSS	
MODEL #:	KAJB010ECAV100	MFG:	COPELAND REFRIGERATION COMPANY				

EMPLOYEE SIGNATURE

SUPERVISOR SIGNATURE

DATE

LABOR				PARTS / MATERIAL			
EMPL ID	HOURS	OT	DATES	PART #	DESCRIPTION	QTY	UNIT COST

DZHC 167-E



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10. ATTACHMENTS (CONTINUED)

10.5 DZHC 167-E: Work Order (Preventative Maintenance)



SOC WORK ORDER DETAIL

WORK ORDER #:	100462	PRIORITY:		WORK TYPE:	PM	START DATE:	Jan 5, 2015 12:00 AM
DESCRIPTION: MERCURY							
LONG DESCRIPTION:							
REPORT DATE:	Dec 15, 2014 2:22 PM	PHONE:		WORK STATUS:	CLOSE		
REPORTED BY:	SPANIERL	ON BEHALF OF:		GL ACCOUNT:	4E5-0715C1-2222-22		
ASSET:	ORU-068	DESCRIPTION:	REFRIGERATION UNIT				
LOCATION:	110-052	DESCRIPTION:	MERCURY STORAGE FACILITY				
LOCATION DETAIL: FOR FIRE SUPPRESSION SYSTEM FOR MERCURY BLDGS				ASSIGNED TO:			
TAG #:		SUPERVISOR:	EQSUPER		LEAD CRAFT:	EM	
SERIAL #:	ET08A00358R	WARRANTY EXP:			CREW ID:	MSS	
MODEL #:	KAJB010ECAV100	MFG:	COPELAND REFRIGERATION COMPANY				

EMPLOYEE SIGNATURE

SUPERVISOR SIGNATURE

DATE

LABOR				PARTS / MATERIAL			
EMPL ID	HOURS	OT	DATES	PART #	DESCRIPTION	QTY	UNIT COST

DZHC 167-E



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10. ATTACHMENTS (CONTINUED)

10.5 DZHC 167-E: Work Order (Preventative Maintenance) (Continued)



SOC WORK ORDER DETAIL

WORK ORDER #:	100462	PRIORITY:		WORK TYPE:	PM	START DATE:	Jan 5, 2015 12:00 AM
JOB PLAN:	EM405	DESCRIPTION:	MONTHLY REFRIGERATION UNIT FOR MERCURY BUILDINGS	FREQ:	2	UNITS:	WEEKS
TASK	DESCRIPTION					OBSERVATION	
10	PERFORM JOB SAFETY ANALYSIS BEFORE STARTING WORK.						
20	GENERAL HOUSEKEEPING (EXCESSIVE OIL, GREASE, ETC)						
30	INSPECT UNIT FOR WORN OR DAMAGED PARTS.						
40	CHECK FOR PROPER OPERATION						
50	CHECK FOR LOOSE BOLTS, SCREWS OR ANCHORS.						
60	CHECK FOR RUST OR CORROSION. UNIT REFRIGERANT CHARGE (404A)						
70	CO2 PRESSURE CONTROL SWITCH HIGH/LOW REFRIGERANT SWITCHES						
80	UNITS PRESSURE GAUGE/VISUAL						
90	ALARM PRESSURE SWITCH						
100	REFRIGERATION MANIFOLD GUAGE SET USED - ID#						
110	NITROGEN PRESSURE REGULATOR USED - ID#						

DZHC 167-E

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10. ATTACHMENTS (CONTINUED)

10.6 DZHC 595-E: Job Safety Analysis (JSA)



JOB SAFETY ANALYSIS

PROJECT TITLE/BUILDING LOCATION:		PAGE OF	DATE:	<input checked="" type="checkbox"/> NEW <input type="checkbox"/> REVISED
TASK OR WORK PERFORMED:		SUPERVISOR(S):		REVIEWED/APPROVED BY: 

PERSONAL PROTECTIVE EQUIPMENT						
EYE PROTECTION <input type="checkbox"/> Safety Glasses <input type="checkbox"/> Goggles <input type="checkbox"/> Face Shield <input type="checkbox"/> Other <input type="checkbox"/> As Required	EAR PROTECTION <input type="checkbox"/> Ear Plugs <input type="checkbox"/> Ear Muffs <input type="checkbox"/> Other <input type="checkbox"/> As Required	HAND PROTECTION <input type="checkbox"/> Leather Palm <input type="checkbox"/> Kevlar <input type="checkbox"/> Rubber <input type="checkbox"/> Other <input type="checkbox"/> As Required	FOOT PROTECTION <input type="checkbox"/> Steel Toe Boots <input type="checkbox"/> Conductive <input type="checkbox"/> Shoes/Straps <input type="checkbox"/> Tyvek Cover <input type="checkbox"/> Other <input type="checkbox"/> As Required	RESPIRATORY PROTECTION <input type="checkbox"/> Dust Mask <input type="checkbox"/> 1/2 Face Respirator <input type="checkbox"/> Full Face Respirator <input type="checkbox"/> SCBA <input type="checkbox"/> Other <input type="checkbox"/> As Required	GARMENTS <input type="checkbox"/> Tyvek <input type="checkbox"/> Tychem <input type="checkbox"/> Flame resistant <input type="checkbox"/> Chaps <input type="checkbox"/> Vest <input type="checkbox"/> Other <input type="checkbox"/> As Required	HEAD PROTECTION <input type="checkbox"/> Hardhat <input type="checkbox"/> Tyvek Hood <input type="checkbox"/> Other <input type="checkbox"/> As Required

JOB STEPS	POTENTIAL HAZARDS	ACTION/PROCEDURE TO CONTROL OR ELIMINATE THE HAZARD

DZHC 595-E (R2)



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10. ATTACHMENTS (CONTINUED)

10.6 DZHC 595-E: Job Safety Analysis (JSA) (Continued)



JOB SAFETY ANALYSIS

JOB STEPS	POTENTIAL HAZARDS	ACTION/PROCEDURE TO CONTROL OR ELIMINATE THE HAZARD

DZHC 595-E (R2)

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